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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,578	03/28/2001	Ahmed A. Busnaina	837BUS-X	3505
7590 James Marc Leas 37 Butler Drive S. Burlington, VT 05403			EXAMINER MARKOFF, ALEXANDER	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 01/14/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/819,578

Applicant(s)

BUSNAINA, AHMED A.

Examiner

Alexander Markoff

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18, 22, 23, 59-81 and 99-102 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 22-23, 59-81 and 99-102 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-18, 22-23, 59-81 and 99-102 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicants amended the claims to recite the specific orientation of the side of the substrate, which has a conductive film thereon. Such is not supported by the original disclosure.

Response to Amendment

3. The applicants amended the claims to recite substrates comprising conductive films. Such is not supported by the parent application. Thereby the prior art is applied taking in consideration that none of the claims has priority of the parent application for the entire scope.

It is also noted that all independent claims recite two parallel transducers (arrays of the transducers). Such is not supported by the parent application. Thereby the prior art is applied taking in consideration that none of the claims has priority of the parent application for the entire scope.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-18, 22-23, 59-81 and 99-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al (US Patent No 6,199,567) in view of WO 01/08200 and Matsushita et al (US Patent No 5,071,776).

Kanno et al teach that it was known to clean wafer with conductive metal films with liquids and megasonic as claimed. See entire document, especially Figures 7, 9-11 and the related description. Kanno et al teaches the claimed frequencies. Kanno et al do not teach the use of the apparatus as claimed.

However, the use of apparatuses with overflow and transducers parallel to both sides of the wafer for cleaning the wafers were known in the art as evidenced by WO 01/08200 and Matsushita et al.

Moreover, Matsushita et al teach such apparatuses as an alternative to the apparatuses with the transducers at the bottom of the tank, which are disclosed by Kanno et al.

It would have been obvious to an ordinary artisan at the time the invention was made to use the apparatuses having construction disclosed by WO 01/08200 and Matsushita et al in the method of Kanno et al with reasonable expectation of adequate results in order to obtain benefits of the apparatuses.

It is noted that WO 01/08200 does not teach the overflow at two sides.

See entire document, especially Figure 1 and the related description.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide overflow on two sides, since it has been held

that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Response to Arguments

8. Applicant's arguments with respect to amended claims have been considered but are moot in view of the new ground(s) of rejection.

The examiner would like to address the arguments directed to WO 01/08200.

The applicants argue that the applied document does not teach the immersion.

The applicants state that the claimed language requires covering completely with liquid, while at least part of the substrate in the WO document is dry.

The examiner disagrees. In the WO document the substrate is cleaned entirely.

The claims do not require immersing of the entire substrate at the same time.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 571-272-1304. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Alexander Markoff
Primary Examiner
Art Unit 1792

AM

ALEXANDER MARKOFF
PRIMARY EXAMINER



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Apparatus for treating substrates the present invention relates to an apparatus to < RTI ID=1.1> Behandeln< /RTI> from substrates, with at least in a gas atmosphere an arranged, < RTI ID=1.2> Behandlungsfluid< /RTI> containing process container, which < at least two below one; RTI ID=1.3> Treatment-fluid-upperflat lying, constantly opened Öffnung < /RTI> towards for linear accomplishing of the substrates exhibits.

A such apparatus, which < for example from; RTI ID=1.4> EP-A-0< /RTI> is, is a static system admits 817,246, with which < RTI ID=1.5> Behandlungsfluid< /RTI> in the process container is located, without moving. This leads to it, < RTI ID=1.6> dass< /RTI> the process by pollution of the treatment fluid within the range of the linear lead-through of the substrates, arising in the container, < in particular; RTI ID=1.7> beeinträchtigt< /RTI> one tigt. A good and homogeneous treatment of the substrates is not possible thus.

Furthermore an apparatus is to < from the JP-A-5-291 223; RTI ID=1.8> Behandeln< /RTI> from substrates admits, with which from above with < RTI ID=1.9> Behandlungsfluid< /RTI> < RTI ID=1.10> befüllbarer< /RTI> Process container two lateral openings exhibits. The openings are lockable by closing elements in each case, in order to avoid during the treatment a withdrawing from treatment fluid to. On the tray of the Prozessbe< RTI ID=1.11> hälters< /RTI> a discharge opening is < RTI ID=1.12> für< /RTI> the treatment fluid intended.

On the basis of the state of the art specified above the present invention the task is the basis to plan an apparatus the entry kind mentioned which makes a homogeneous and improved treatment possible of substrates in simple and economical way.

The task is < according to invention with an apparatus to; RTI ID=1.13> Behandeln< /RTI> from substrates, with at least in a gas atmosphere an arranged, < RTI ID=1.14> Behandlungsfluid< /RTI> < RTI ID=1.15> enthaltenden< /RTI> Process container, which unter< at least two; RTI ID=1.16> halb< /RTI> one < RTI ID=1.17> Treatment-fluid-upperflat lying Öffnungen< /RTI> for linear accomplishing of the substrates exhibits, in one < RTI ID=1.18> Überlauf< /RTI> for the Behand< RTI ID=2.1> lungsfluid gelöst.< /RTI> By < RTI ID=2.2> Überlauf< /RTI> < RTI ID=2.3> für< /RTI> the treatment fluid is made possible a constant Hindurchleiten by treatment fluid by the process container. Thereby are < RTI ID=2.4> erhöhte< /RTI> Impurity concentrations within certain ranges of the process container, in particular in the linear < RTI ID=2.5> Durchführbe< /RTI> richly the substrates prevents and/or. Changes of concentration of the cleaning media (consumption during the purification) again balanced. Thereby an improved and homogeneous treatment of the substrates is ge< RTI ID=2.6> währleistet.< /RTI> Furthermore by one one < RTI ID=2.7> Überlauf< /RTI> in simple and economical way in < RTI ID=2.8> substantial even treatment fluid level während< /RTI> the treatment and thus a constant pressure of the treatment fluid at the openings < RTI ID=2.9> sichergestellt.< /RTI> Despite a current of the treatment fluid can by < RTI ID=2.10> gleichmässigen< /RTI> Pressure to be prevented in a simple manner that < RTI ID=2.11> Behandlungsfluid< /RTI> from the process container flows.

With a particularly preferred embodiment of the invention is < RTI ID=2.12> Überlauf< /RTI> höhenverstellbar, around the treatment fluid level within the process container too < RTI ID=2.13> verändern.< /RTI> This is in particular favourable, if within the process container treatments with different < RTI ID=2.14> treatment < /RTI> < RTI ID=2.15> fluid durchgeführt< /RTI> become, which exhibit different densities, and same Fluidniveau on the openings different pressure ratios which are under the treatment fluid surface devoted < RTI ID=2.16> würden.< /RTI>

These can < RTI ID=2.17> über< /RTI> the höhenverstellbaren < RTI ID=2.18> Überlauf< /RTI> are adjusted, in order to prevent a out flowing of the treatment fluid by the openings.

Preferably is < RTI ID=2.19> geschlossener< /RTI> < RTI ID=2.20> Überlaufbehälter< /RTI> planned, around that < RTI ID=2.21> Anle< /RTI> towards a vacuum in one < RTI ID=2.22> oberhalb< /RTI> the treatment fluid surface formed air space too < RTI ID=2.23> make possible. Über< /RTI> the vacuum can be produced an underpressure at the openings lying underneath the treatment fluid surface, in order to prevent a out flowing of the treatment fluid. < RTI ID=2.24> Insbesondere< /RTI> in combination with < RTI ID=2.25> höhenverstellbaren spill sheet leaves; /RTI> a simple control that pressure ratios at the openings reach themselves. In the air space present above the treatment fluid preferably one < RTI ID=2.26> gleichmässiges< /RTI> Vacuum intended. Itself for example through the different of treatment fluid (due to different densities) resulting in pressure changes in the openings are preferably < by; RTI ID=3.1> höhenverstellbare Überlaufkante< /RTI> regu< RTI ID=3.2> liert.< /RTI> Over a good and < RTI ID=3.3> gleichmässiges< /RTI> Vacuum to make possible, are < thereby the process container and; RTI ID=3.4> Überlaufbehälter< /RTI> locked.

< RTI ID=3.5> Für< /RTI> one < RTI ID=3.6> gleichmässige< /RTI> and homogeneous current within the process container is preferably < the treatment fluid; RTI ID=3.7> über< /RTI> an essentially horizontal arranged diffuser plate into the process container introducable. With a further embodiment of the invention collecting gutter is attached at the outer circumference of the process container, in order to prevent, < below at least one of the openings; RTI ID=3.8>

With a preferential embodiment of the invention at least one is < RTI ID=3.11> UI-< /RTI> < RTI ID=3.12> trasschalleinrichtung< /RTI> within the process container intended, over by < RTI ID=3.13> Beschallung< /RTI> the substrates their treatment, in particular cleaning procedures too < RTI ID=3.14> fördern.< /RTI> The ultrasonic mechanism extends preferably < RTI ID=3.15> über< /RTI> the entire width of the process container, perpendicularly to the direction of motion of the substrates as well as tiltable, around mA sssige < RTI ID=3.16> Beschallung< /RTI> the substrates < RTI ID=3.17> über< /RTI> to plan their entire surface away. Around one < RTI ID=3.18> gleichmässige< /RTI> and homogeneous current < RTI ID=3.19> treatment < /RTI> fluid within the process container too < RTI ID=3.20> make possible, < /RTI> points < RTI ID=3.21> Ultraschallein < /RTI> direction preferably a flowdynamic form up, D. h. that it exhibits a small flow resistance in direction of flow. < RTI ID=3.22> Für< /RTI> a good and < RTI ID=3.23> gleichmässige< /RTI> Treatment of both < RTI ID=3.24> Oberflächen< /RTI> the substrate is preferably < it between at least two; RTI ID=3.25> Ultraschalleinrichtungen< /RTI> through more movable.

In accordance with a further, preferential embodiment of the invention several one behind the other arranged process containers are intended. These make possible that the substrates without a necessary change of their adjustment go through several, if necessary different process steps. The process containers contain preferably different Be< RTI ID=4.3> action fluid, < /RTI> in order to plan different process steps. Between < RTI ID=4.4> Prozessbehältern< /RTI> preferably if a humidification mechanism is intended, in order to prevent, < RTI ID=4.5> dass< /RTI> the substrates between the sequential process steps antrocknen, which < RTI ID=4.6> nachfolgende< /RTI> Process steps beein< RTI ID=4.7> pregnant könnten.< /RTI> Preferably the humidification mechanism is in such a manner out-arranged, < RTI ID=4.8> dass< /RTI> the substrates to be roughly rinsed, whereby it is prevented that treatment fluid of one < RTI ID=4.9> Prozessbehälter< /RTI> at the next arrives.

Figure 1 shows one < RTI ID=4.15> Behandlungsvorrichtung< /RTI> 1 < RTI ID=4.16> für< /RTI> a semiconductor wafer 3, with a humidification mechanism 4, a wafer transportation unit 6, a process container 8 and a wafer transportation unit 10. While a treatment of the substrate 3 it is < RTI ID=4.17> gemäß< /RTI> the figure moved by from left by the wafer transportation unit 6 the humidification mechanism 4 and afterwards into the process container 8 < RTI ID=4.18> introduced, < /RTI> and partly by this through pushed. On the other side the wafer 3 by the wafer transportation unit 10 is taken up and pulled out of the process container 8. < RTI ID=5.1> zelheiten< /RTI> the transport device are zu< /RTI> in on the same Anmelderin; RTI ID=5.2> backgoing, < /RTI> and on the same day submitted patent application with the title " method and apparatus to the transport one < RTI ID=5.3> Halbleiterwafer< /RTI> by a treatment container " described, which is made the subject-matter of the present invention to that extent, over < RTI ID=5.4> Wiederholungen< /RTI> to avoid.

The humidification mechanism 4 possesses a multiplicity of nozzles 11, over which a fluid < as for example; RTI ID=5.5> DL-Wasser< /RTI> on at least one < RTI ID=5.6> Oberfläche< /RTI> the wafer 3 is sprayed to hold in order to moisten it, or if it is already moist, moist. Although this in the figure does not < RTI ID=5.7> dargestellt< /RTI> is, the nozzles can be arranged 11 against the direction of motion of the wafer 3, in order to reach a flushing, at least a surface of the wafer 3. Beside < RTI ID=5.8> dargestellten< /RTI> Humidification mechanism 4, under which the wafer 3 is through-moved, is it also possible, second, the humidification mechanism 4 < RTI ID=5.9> gegenüberliegende< /RTI> Humidification mechanism to plan, then < RTI ID=5.10> dass< /RTI> the wafer 3 by both humidification mechanisms is through moved, and is thus from both sides moistened.

The process container 8 is formed through for an essentially closed container body 14, < the one; RTI ID=5.11> Einführöffnung < /RTI> 15, one < RTI ID=5.12> Ausführöffnung < /RTI> 16 as well as one < RTI ID=5.13> Überlauföffnung < /RTI> 17 exhibits. < RTI ID=5.14> Einführöffnung < /RTI> 15 and the Aus < RTI ID=5.15> führöffnung < /RTI> 16 is actually opposite side walls of the container body 14 < on one level; RTI ID=5.16> ausgebildet.< /RTI> Further one, not the openings 15.16 exhibiting < RTI ID=5.17> Seitenwände < /RTI> the container body 14 guide rails 18 exhibit 3 within the process container 8 to the slide mechanism the wafer.

The openings 15.16 < RTI ID=5.18> liegen< /RTI> underneath < RTI ID=5.19> Überlauföffnung< /RTI> 17 and lies thus underneath a treatment fluid surface one in < RTI ID=5.20> Prozessbehälter< /RTI> 8 of treatment fluid present 20. The openings 15.16 can be particularly formed out, as for example in the EP-A-0 817,246 described are < , 8 present around flowing out in the process container; RTI ID=5.21> treatment < /RTI> to prevent fluid 20. The EP-A-0 817,246 is made the subject-matter of the present invention to that extent, < over; RTI ID=5.22> Wiederholungen< /RTI> to avoid.

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to each other and is elevatormoderately below and/or. above the openings 15, 16 arranged, so that those wafer 3 with their movement by the Prozessbe< RTI ID=6.7> hält< /RTI> by the ultrasonic mechanisms 24.26 to be through moved. From each other the trailblazing sides < RTI ID=6.8> Ultraschalleinrichtungen< /RTI> 24,26 is < in each case; RTI ID=6.9> tapered, < /RTI> in order to impair from bottom to top the fluid flow arranged in the process container 8 as few as possible.

< RTI ID=6.10> Im< /RTI> Range < RTI ID=6.11> Eingangsöffnung< /RTI> a collecting gutter 30 intended 15 below the opening 15 is, over gegeb< at the outer circumference of the container body 14; RTI ID=6.12> nenfalls< /RTI> < RTI ID=6.13> über< /RTI> the opening 15 leaking out < RTI ID=6.14> Behandlungsfluid< /RTI> to catch, and on suitable to derive way not represented more near.

< RTI ID=6.15> Ausführöffnung< /RTI> 16 is by a Trocknungskammer 32 surrounded, which is attached at the outer circumference of the container body 14 and an integrated collecting gutter exhibits. The Trocknungskammer 32 exhibits an opening 33, by which the wafer 3 can be moved through. < RTI ID=6.16> Innerhalb< /RTI> the Trocknungskammer 33 are < RTI ID=6.17> Düsen< /RTI> 34,35 intended, over those the surface tension of the treatment fluid reducing < RTI ID=6.18> Fluid< /RTI> into the range < RTI ID=6.19> Ausführöffnung< /RTI> 16 to be led can do. As surface tension reducing < RTI ID=6.20> Fluid< /RTI> for example IPA is, < RTI ID=6.21> heisses< /RTI> Gas, as for example < RTI ID=6.22> heisses< /RTI> N2 etc. been suitable. That < RTI ID=6.23> Oberflächenspannung< /RTI> < RTI ID=6.24> treatment < /RTI> fluid reducing < RTI ID=6.25> Fluid< /RTI> one < RTI ID=6.26> über< /RTI> the nozzles 34.35 purposeful on one between < RTI ID=6.27> Behandlungsfluid< /RTI> 20 and the wafer 3 formed meniscus arranged, over there a good drying process < RTI ID=6.28> gemäss< /RTI> the Marangonieprinzip too erreichen. Alternatively < RTI ID=7.1> könnte< /RTI> the meniscus also in other kind, as for example with a laser heated, over within this range a reduction are < RTI ID=7.2> Oberflächenspannung< /RTI> to reach. Figure 2 shows one < RTI ID=7.3> vergrößerte< /RTI> Detail opinion of the Trocknungskammer 32, whereby the nozzles 34.35 were omitted for the simplification of the display. As is to be recognized 2 in figure, is < in a lower; RTI ID=7.4> Hälfte< /RTI> the Trocknungskammer 32 a needle-shaped element 36 intended, which serves as gutter. At the rear edge of wafer the drying procedure is < RTI ID=7.5> mittels< /RTI> the Marangonieeffekts with the withdrawal from the chamber critical and it can come to it, < RTI ID=7.6> dass< /RTI> solid fluid at the wafer adheres and a drop forms. This drop is < however by; RTI ID=7.7> Tropfenfänger< /RTI> 37, that with a small spacing as for example < 1 millimeter to the wafer and at its wafer center positioned is derived.

In the upper wall of the container body 14 an opening not represented more near is intended, which stands with a vacuum device 37 in connection, then < RTI ID=7.8> dass< /RTI> in above treatment fluid 20 formed air space 40 an underpressure to be put on can, around a out flowing < RTI ID=7.9> treatment < /RTI> to prevent fluid from the process container 8. Also different mediums can do on and/or. in the process container 8 intended its, in order to prevent a out flowing of the treatment fluid, as they are described for example in the EP-A-0 817,246, to the subject-matter of the available < to that extent; RTI ID=7.10> Anmel< /RTI> dung is made, in order to avoid repetitions.

< RTI ID=7.11> Überlauföffnung< /RTI> that is surrounded 17 in sealed way to < by an essentially closed overflow tank 42; RTI ID=7.12> Aussenumfang< /RTI> the container body 14 is fastened. Within < RTI ID=7.13> Überlaufbehälters< /RTI> 42 and/or. at an external wall < RTI ID=7.14> Prozessbehäl< /RTI> terkörpers< /RTI> 14 a slide 44 is intended, the one < RTI ID=7.15> Überlaufkante< /RTI> 45 defines. The slide 44 is < RTI ID=7.16> über< /RTI> one does not < RTI ID=7.17> näher< /RTI> < RTI ID=7.18> dargestellte< /RTI> Apparatus vertical adjustably, around a height adjusting < RTI ID=7.19> Überlaufkante< /RTI> 45, and thus the level of the treatment fluid 20 in the process container 8 < RTI ID=7.20> einzustellen.< /RTI> One < RTI ID=7.21> Einstellbereich< /RTI> by Ober-und lower edges < RTI ID=7.22> Überlauföffnung< /RTI> 17 limits.

Although in the figure only one process container 8 < RTI ID=8.1> dargestellt< /RTI> is, it is to be arranged possible several process containers one behind the other, then < RTI ID=8.2> dass< /RTI> a wafer 3 on its linear movement path several process containers to travel through can. The respective process containers can with < RTI ID=8.3> unterschiedlichen< /RTI> Treatment fluid filled its, around different treatment steps, like z. B. Etching, neutralizing and purifying to accomplish as well as drying. Preferably a humidification mechanism 4 is intended, in order to prevent a drying of treatment fluid between successive process steps between successive in each case process containers 8. Furthermore a rough prepurifying the same can be achieved by the humidification of the substrates, so that a kidnapping that of treatment fluid from a process container < to; RTI ID=8.4> nächsten< /RTI> one decreases. Since different treatment fluid the usually different densities exhibit, the level of the treatment fluid is < RTI ID=8.5> über< /RTI> the slide 44 so in each case adjusted, < RTI ID=8.6> dass< /RTI> the pressure of the treatment fluid at respective Ein-und implementing openings 15.16 in addition does not < RTI ID=8.7> leads, < /RTI> that the treatment fluid from the process container out-flows. Furthermore one < RTI ID=8.8> über< /RTI> the vacuum device 37 an underpressure in < RTI ID=8.9> über< /RTI> < RTI ID=8.10> Behandlungsfluid< /RTI> air space present produces, in order to reduce the treatment fluid pressure lining up at the openings 15.16 further. All are preferably one behind the other < RTI ID=8.11> geschalteten< /RTI> Process container 8 with one < RTI ID=8.12> einzelnen< /RTI> Vacuum device connected, which in the respective process containers one < in each case; RTI ID=8.13> gleichmässigen< /RTI> Underpressure produces or with same < RTI ID=8.14> Schieberhöhe< /RTI> < RTI ID=8.15> different Unterdrücke.< /RTI> By different densities that of treatment fluid developing pressure changes in the openings 15.16 are < RTI ID=8.16> über< /RTI> the slide 44, and thus the level of the treatment fluid 20 in < RTI ID=8.17> Prozessbehäl< /RTI> tern< /RTI> balanced, so that no treatment fluid withdraws over the openings 15.16 from the process containers 8.

With the treatment the wafer 3 is < first over the diffuser plate 22 treatment fluid 20 into the process container 8 introduced to this over; RTI ID=8.18> Überlaufkante< /RTI> 45 of the slide 44 in < RTI ID=8.19> Überlaufbehälter< /RTI> 42 < RTI ID=8.20> fließt.< /RTI> < RTI ID=8.21> Über< /RTI> the diffuser plate 22 is constantly led treatment fluid into the process container 8, so that a homogeneous upward arranged current develops within the process container. Subsequently, one < RTI ID=9.1> über< /RTI> < RTI ID=9.2> Einführöffnung< /RTI> 15 a wafer 3 pushed into the process container 8 inside and partly there through. Vorder-und is < RTI ID=9.3> Rückseiten< /RTI> the wafer 3 by means of < RTI ID=9.4> Ul< /RTI> traschalleinrichtungen 24.26 < RTI ID=9.5> beschallt.< /RTI> < RTI ID=9.6> Innerhalb< /RTI> the process container 8 those are < wafer 3 by the lateral slide mechanisms 18; RTI ID=9.7> geführt.< /RTI> If a front end of the wafer 3 by the process container 8 through < RTI

ID=9.8> geführt< /RTI> is, the meniscus developing thereby is < between; RTI ID=9.9> Behandlungsfluid< /RTI> 20 and wafer 3 with < RTI ID=9.10> Oberflächenspannung< /RTI> the treatment fluid 20 of reducing fluid < RTI ID=9.11> subjected, < /RTI> whereby the wafer 3 with the removal from the Be< RTI ID=9.12> handlungsfluid< /RTI> 20 one dries. The guidance end of the wafer 3 is taken up by the transportation unit 10 and pulled completely by the process container 8 through and transported if necessary to a following process container 8.

< RTI ID=9.13> Obwohl< /RTI> the invention on the basis a preferential embodiment was described, is noticed that the invention is not limited to this embodiment. For example are < RTI ID=9.14> Merkmale< /RTI> the Trocknungskammer 32 with process containers 8 not necessarily, which a further process container is downstream. Furthermore details are < RTI ID=9.15> Ausgestaltung< /RTI> < RTI ID=9.16> Ultraschalleinrichtung< /RTI> not compellingly, there < RTI ID=9.17> abhängig< /RTI> of to treating substrate for example one < RTI ID=9.18> einzelne< /RTI> < RTI ID=9.19> Ultraschalleinrichtung< /RTI> to the treatment of a substrate surface is sufficient. Also one is < RTI ID=9.20> Diffusorplatte< /RTI> 22 compellingly necessarily and does not < RTI ID=9.21> könnte< /RTI> instead of its or in combination with < RTI ID=9.22> Diffusorplatte< /RTI> < RTI ID=9.23> trichterförmiger< /RTI> Tray with one < RTI ID=9.24> Einlassöffnung< /RTI> are planned. Also the vacuum device 37 is not necessarily necessary, since the pressure which is applied at the openings 15.16 also < RTI ID=9.25> über< /RTI> other one < RTI ID=9.26> Composition, < /RTI> as for example a capillary device, to be regulated can. The pressure necessary thereby is < RTI ID=9.27> über< /RTI> the movable slide 44 regulated. The respective < RTI ID=9.28> Merkmale< /RTI> < RTI ID=9.29> Behandlungsvorrichtung< /RTI> 1 can do in combination or also in each case < RTI ID=9.30> individually, < /RTI> D. h. < RTI ID=9.31> unabhängig< /RTI> from each other to be used.